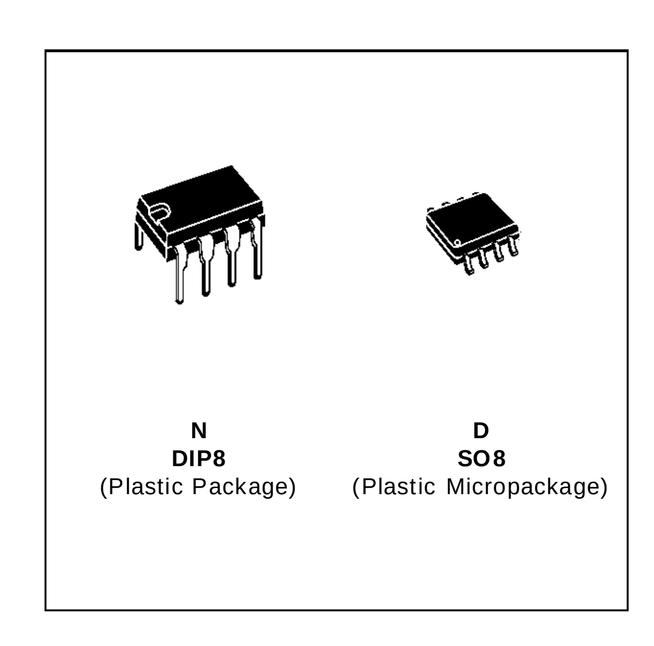


MC1458
MC1558

DUAL OPERATIONAL AMPLIFIERS

- LOW POWER CONSUMPTION
- LARGE INPUT VOLTAGE RANGE
- NO LATCH-UP
- HIGH GAIN
- SHORT-CIRCUIT PROTECTION
- NO FREQUENCY COMPENSATION REQUIRED



N
DIP8
(Plastic Package)

D
SO8
(Plastic Micropackage)



DESCRIPTION

The MC1458 is a high performance monolithic dual operational amplifier constructed on a single silicon chip. It is intended for a wide range of analog applications.

- Summing amplifier
- Voltage follower
- Integrator
- Active filter
- Function generator

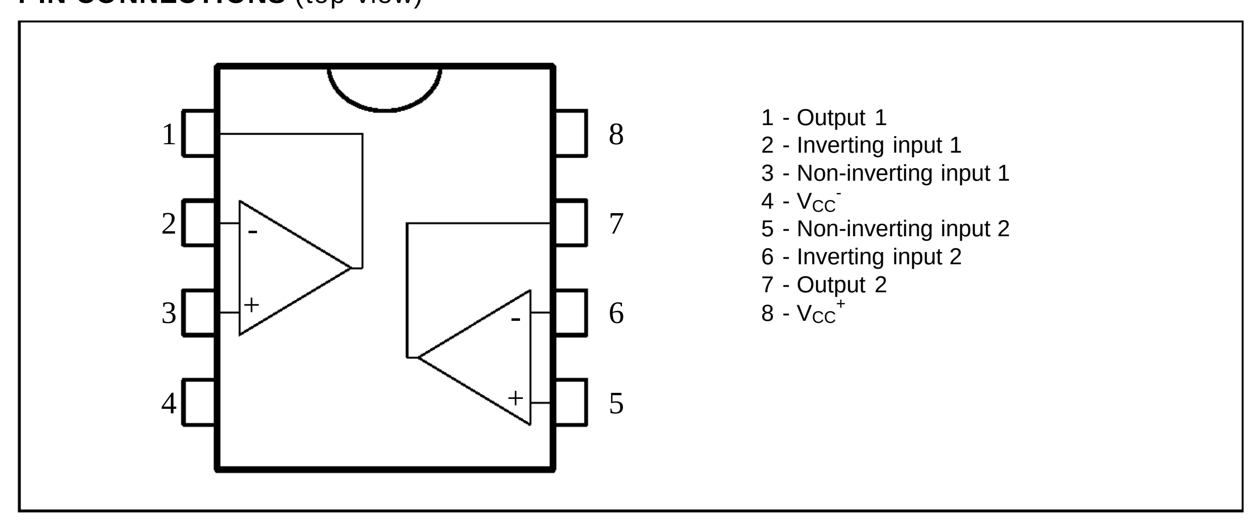
The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifier, and general feed back applications.

ORDER CODES

Part Number	Temperature Range	Package	
		N	D
MC1458	0, +70°C	•	•
MC1458I	–40, +105°C	•	•
MC1558	–55, +125°C	•	•
Example : MC1458H			

1458-01.TBL

PIN CONNECTIONS (top view)



SCHEMATIC DIAGRAM

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	MC1458	MC1458I	MC1558	Unit
V_{CC}	Supply Voltage	±22	±22	±22	V
V_i	Input Voltage	±15	±15	±15	V
V_{id}	Differential Input Voltage	±30	±30	±30	V
P_{tot}	Power Dissipation				mW
	D Suffix		300		
	N Suffix		500		
	Output Short-circuit Duration		Infinite		
T_{oper}	Operating Free-air Temperature Range	0 to +70	–40 to +105	–55 to +125	°C
T_{stg}	Storage Temperature Range	–65 to +150	–65 to +150	–65 to +150	°C

1458-02.TBL



ELECTRICAL CHARACTERISTICS

V_{CC} = ±15V, T_{amb} = 25°C, (unless otherwise specified)

Symbol	Parameter	MC1458 - 1458I - 1558			Unit
		Min.	Typ.	Max.	
V_{io}	Input Offset Voltage ($R_S \leq 10k\Omega$) T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$		1	5 6	mV
I_{io}	Input Offset Current T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$		2	200 300	nA
I_{ib}	Input Bias Current T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$		30	500 800	nA
A_{vd}	Large Signal Voltage Gain (V_O = ±10V, $R_L = 2k\Omega$) T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$	50 25	200		V/mV
SVR	Supply Voltage Rejection Ratio ($R_S \leq 10k\Omega$) T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$	77 77	90		dB
I_{CC}	Supply Current, all Amp, no Load T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$		2.3	5 6	mA
V_{icm}	Input Common Mode Voltage Range T_{amb} = 25°C $T_{min.} \leq T_{amb} \leq T_{max.}$	±12 ±12			V
CMR	Common-mode Rejection Ratio ($R_S \leq 10\ k\Omega$) T_{amb} = 25°C $T_{min} \leq T_{amb} \leq T_{max}$	70 70	90		dB
I_{OS}	Output Short-circuit Current T_{amb} = 25°C	10	20	35	mA
$\pm V_{OPP}$	Output Voltage Swing T_{amb} = 25°C $R_L = 10k\Omega$ $R_L = 2k\Omega$ $T_{min.} \leq T_{amb} \leq T_{max.}$ $R_L = 10k\Omega$ $R_L = 2k\Omega$	12 10 12 10	14 13		V
SR	Slew Rate (V_I = ±10V, $R_L = 2k\Omega, C_L$ = 100pF, T_{amb} = 25°C, unity gain)	0.2	0.8		V/μs
t_r	Rise Time (V_I = 20mV, $R_L = 2k\Omega$, C_L = 100pF, T_{amb} = 25°C, unity gain)		0.3		μs
K_{OV}	Overshoot (V_I = 20mV, $R_L = 2k\Omega$, C_L = 100pF, T_{amb} = 25°C, unity gain)		5		%
R_I	Input Resistance	0.3	2		MΩ
Zic	Common-mode Input Impedance		200		MΩ
C_I	Input Capacitance		1.4		pF
R_O	Output Resistance		75		Ω
FPB	Full Power Bandwidth ($R_L = 2k\Omega$, $V_O \geq$ ±10V, A_{VD} = 1, THD ≤ 5%)		14		KHz
B	Unity Gain Bandwidth (V_I = 10mV, $R_L = 2k\Omega$, C_L = 100pF, T_{amb} = 25°C)		1		MHz

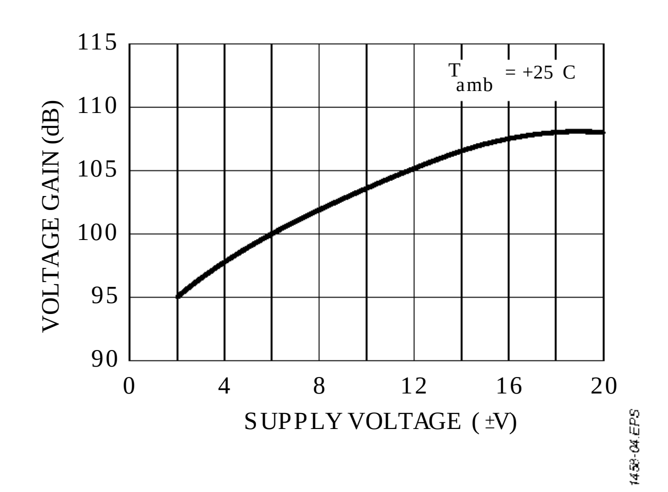
1458-03.TBL

ELECTRICAL CHARACTERISTICS (continued)

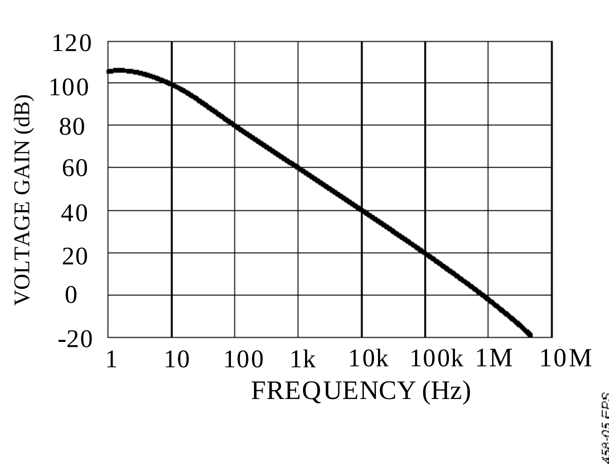
Symbol	Parameter	MC1458 - 1458I MC1558			Unit
		Min.	Typ.	Max.	
GBP	Gain Bandwidth Product (V_I = 10mV, R_L = 2kΩ, C_L = 100pF, f = 100kHz, T_{amb} = 25°C)	0.4	1		MHz
THD	Total Harmonic Distortion (f = 1kHz, A_V = 20dB, R_L = 2kΩ, V_O = 2V_{PP}, C_L = 100pF, T_{amb} = 25°C)		0.02		%
e_n	Equivalent Input Noise Voltage (f = kHz, R_s = 100Ω)		45		$\frac{nV}{\sqrt{Hz}}$
∅m	Phase Margin		65		Degrees
Am	Gain Margin		11		dB
V_{O1}/V_{O2}	Channel Separation		120		dB

1458-04.TBL

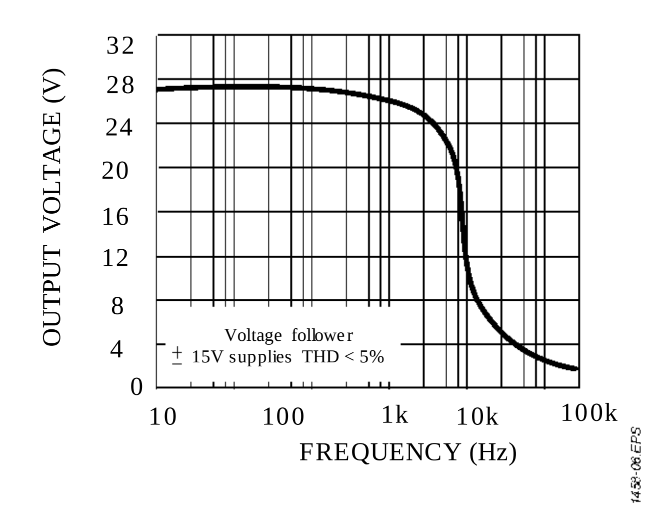
OPEN LOOP VOLTAGE GAIN



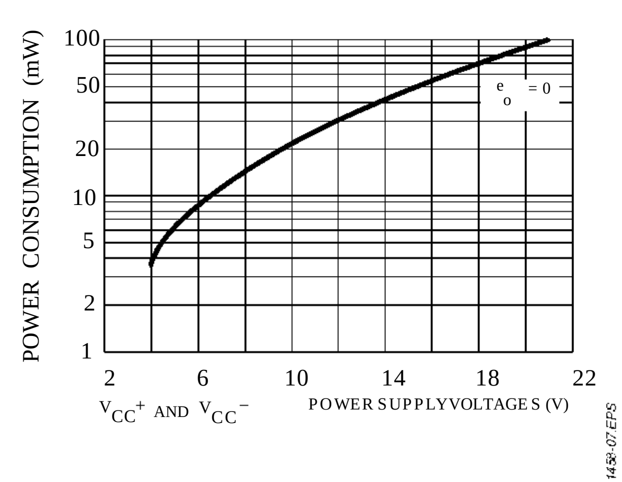
OPEN LOOP FREQUENCY RESPONSE



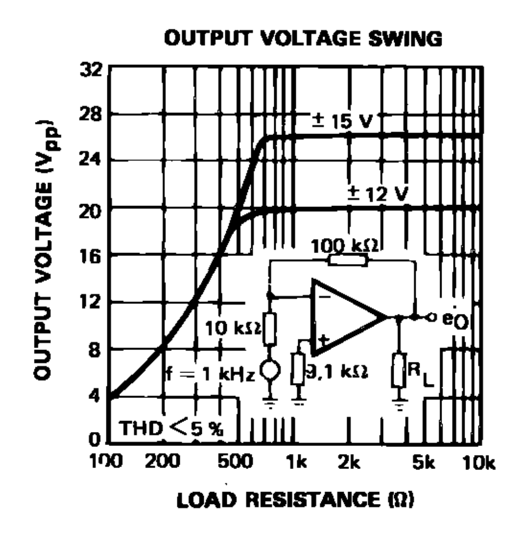
POWER BANDWIDTH (LARGE SIGNAL SWING)

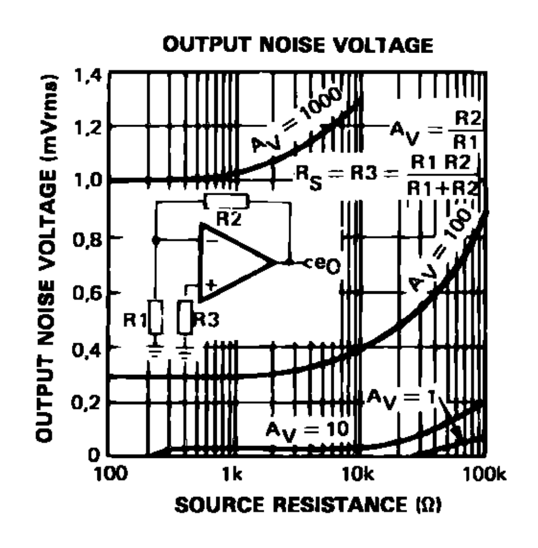


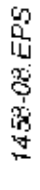
POWER CONSUMPTION

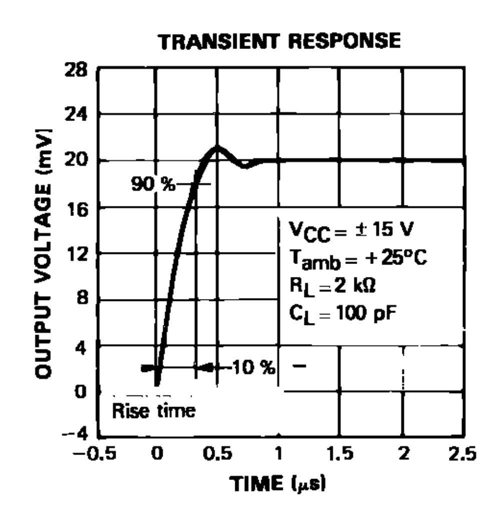


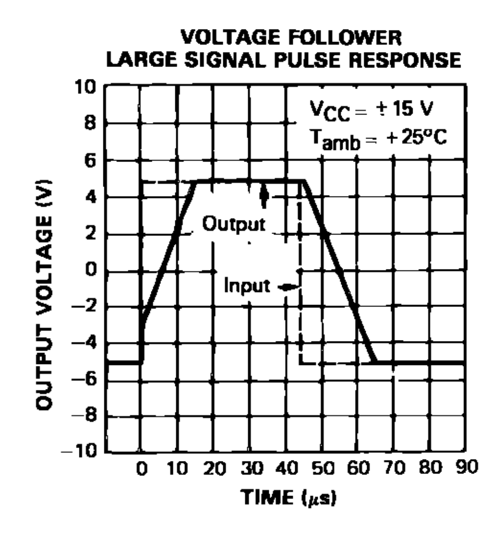


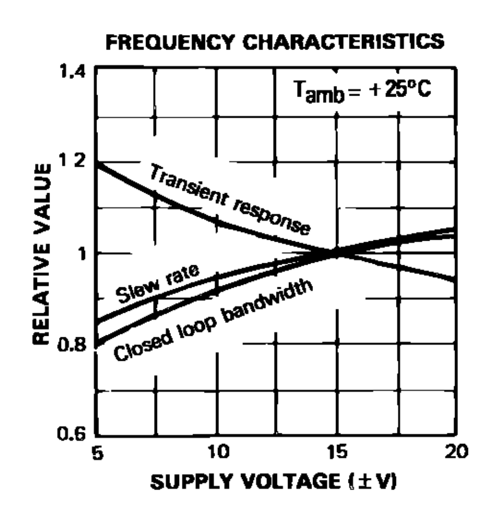

OUTPUT VOLTAGE SWING
OUTPUT VOLTAGE (Vpp)
± 15 V
± 12 V
100 kΩ
10 kΩ
f = 1 kHz
9.1 kΩ
eO
RL
THD < 5 %
LOAD RESISTANCE (Ω)

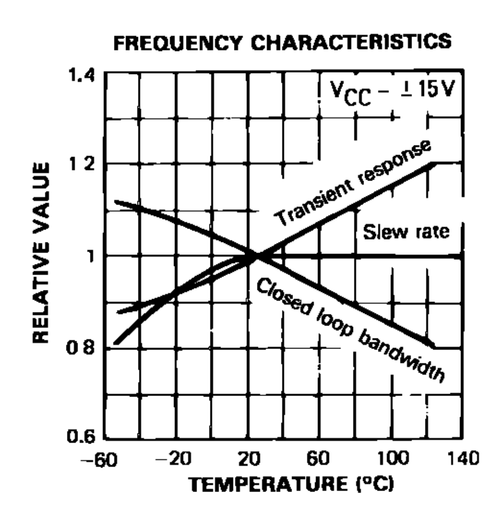

OUTPUT NOISE VOLTAGE
OUTPUT NOISE VOLTAGE (mVrms)
AV = 1000
AV = R2/R1
RS = R3 = R1 R2/(R1+R2)
R2
eO
R1
R3
AV = 100
AV = 1
AV = 10
SOURCE RESISTANCE (Ω)


1458-08.EPS


TRANSIENT RESPONSE
OUTPUT VOLTAGE (mV)
90 %
VCC = ± 15 V
Tamb = +25°C
RL = 2 kΩ
CL = 100 pF
10 %
Rise time
TIME (µs)


VOLTAGE FOLLOWER
LARGE SIGNAL PULSE RESPONSE
VCC = ± 15 V
Tamb = +25°C
Output
Input
OUTPUT VOLTAGE (V)
TIME (µs)


FREQUENCY CHARACTERISTICS
Tamb = +25°C
RELATIVE VALUE
Transient response
Slew rate
Closed loop bandwidth
SUPPLY VOLTAGE (± V)

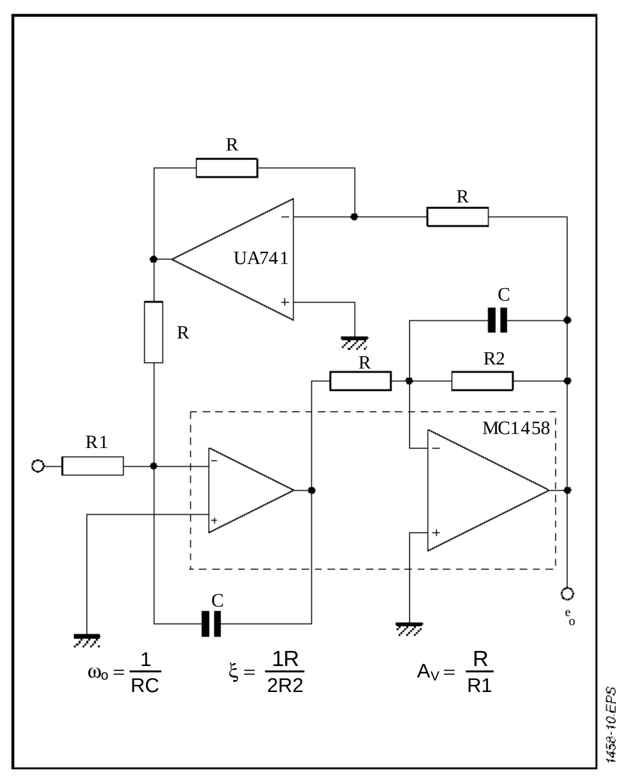

FREQUENCY CHARACTERISTICS
VCC = ± 15V
RELATIVE VALUE
Transient response
Slew rate
Closed loop bandwidth
TEMPERATURE (°C)

1458-09.EPS

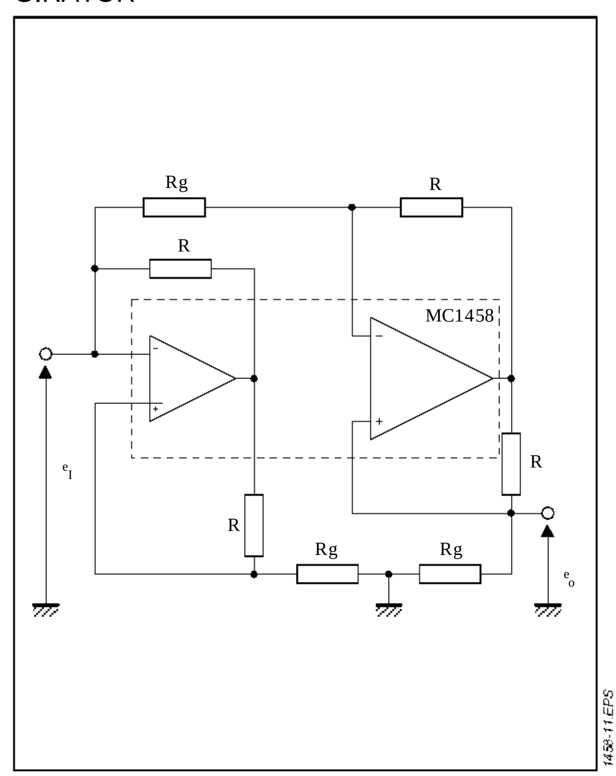

SGS-THOMSON
MICROELECTRONICS

TYPICAL APPLICATIONS

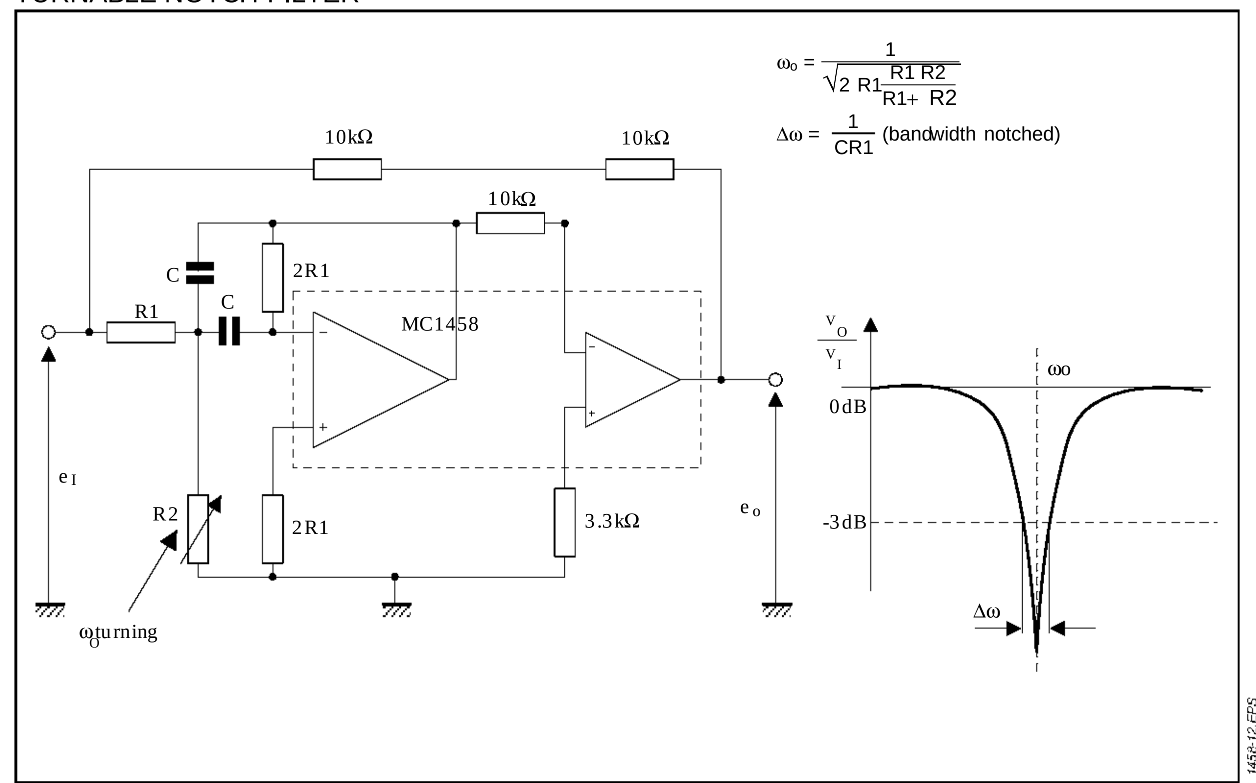
LOW PASS FILTER



GIRATOR

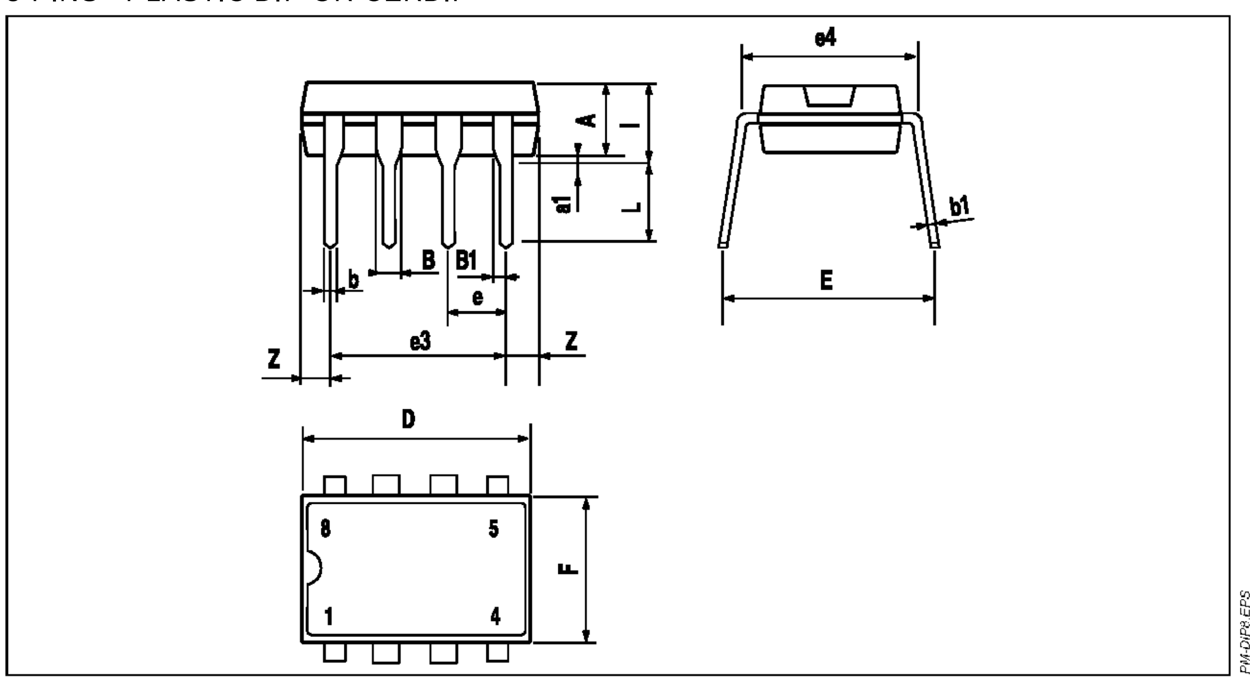


TURNABLE NOTCH FILTER



PACKAGE MECHANICAL DATA

8 PINS - PLASTIC DIP OR CERDIP

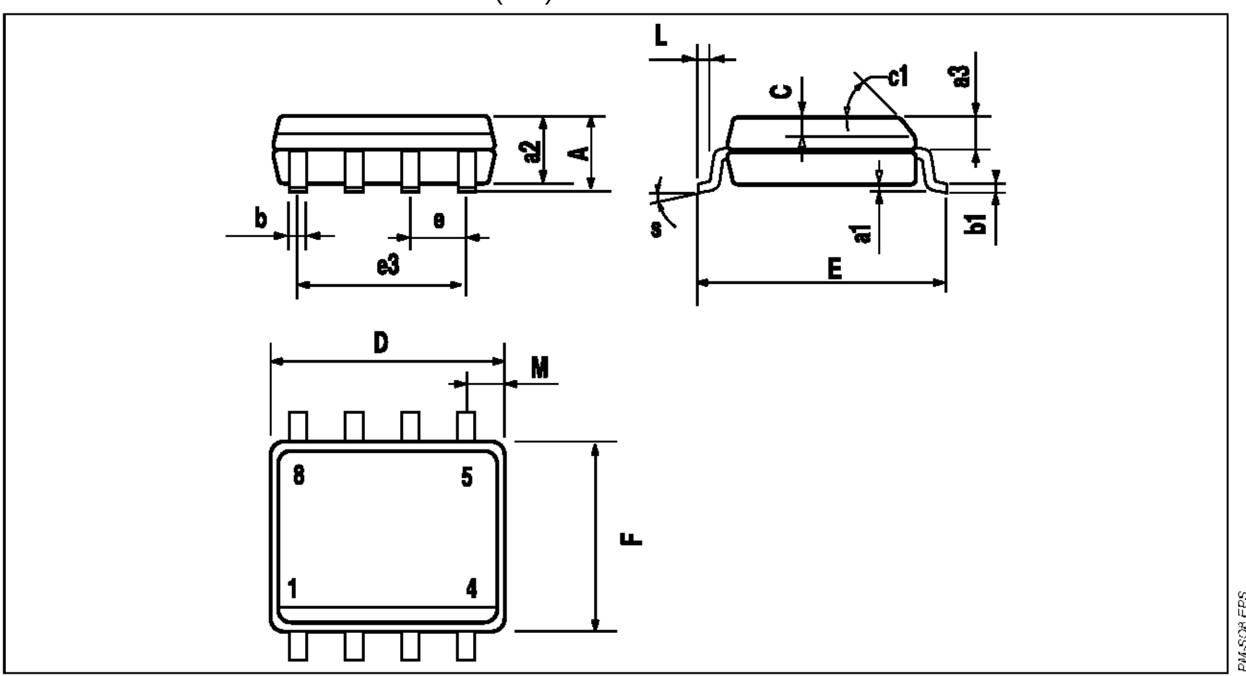


Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0260
i			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060

DIP8.TBL

PACKAGE MECHANICAL DATA

8 PINS - PLASTIC MICROPACKAGE (SO)



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45^{o} (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.150		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8^{o} (max.)					

SO8.TBL